REMARK/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-5 are presently active, Claims 6-9 are currently withdrawn from consideration, and Claim 1 has been presently amended. No new matter has been added.

In the outstanding Office Action, Claims 2 and 3 were rejected under 35 U.S.C. § 112, first paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chiang et al (U.S. Patent Appl. Publ. No. 2002/0073924 A1) in view of Wong et al (U.S. Patent No. 5,725,913) and Bang et al (U.S. Patent Appl. Publ. No. 2004/0083963 A1.

Regarding the 35 U.S.C. § 112, first paragraph, rejection: Claim 1 has been amended to clarify the feature which the examiner identified as presenting an issue with respect to the 35 U.S.C. § 112, first paragraph, rejection. Support for the clarifications is found in Applicants' Figures 1 and 2, on page 10, lines 20-25, and on page 11, lines 15-30. Thus, the 35 U.S.C. § 112, first paragraph, rejection has been overcome.

The art deficiencies: Claim 1 as clarified defines:

> A processing apparatus performing a process on a substrate while supplying a plurality of process gases, each of which is a mixture of a source gas and an inert gas, comprising:
> a process chamber in which the substrate is accommodated;
> a placement stage on which the substrate is placed in said process chamber, the placement stage having a heater incorporated therein;
> process gas supply means for ***alternately supplying the process gases*** into the process chamber;
> exhaust means that evacuates the process gas from said process chamber;
> pressure detecting means for detecting a pressure in said process chamber; and

> control means for controlling an amount of flow of each of the process gases supplied to said process chamber based on a result of detection of the pressure detecting means so that the pressure in said process chamber becomes constant,
>
> wherein said control means ***controls the amount of flow of each of the process gases so as to maintain pressure inside the process chamber to be constant while alternately supplying the process gases***, thereby maintaining a temperature of the substrate to be constant..

The Office Action acknowledged on page 3 that the Chiang et al reference does **not** teach "a control means that maintains a constant pressure by controlling an amount of flow of the process and inert gas supplied to said process chamber." However, the Office Action thereafter cited the Wong et al reference for its description of multiple controllers 52, 66, 68 maintains a constant pressure in a coating chamber 12 by controlling the supply of an inert gas. The Office Action then asserted that:

> The motivation for replacing the pressure control means of Chiang et al with one of the pressure control means of Wong et al is to provide an alternate control means to maintain a constant pressure in the process chamber.

That is the Office Action considers the motivation of combining to be one of a simple substitution of the pressure control means of Chiang et al for pressure control means of Wong et al reference.

However, Applicants submit that there is ***no proper motivation or rationale*** to combine the Wong et al reference with the Chiang et al reference. The Chiang et al reference relates to an ALD apparatus (as the Office Action acknowledges) in which an ALD process is performed. Meanwhile, the Wong et al reference is directed to a sputter apparatus in which a sputtering process is performed. Generally, the examiner will appreciate that a sputtering process is performed by forming plasma in an Ar gas atmosphere so as to generate Ar ions. The Ar ions are pulled by and hit a target, which causes atoms of the target being released from the surface of the target. The atoms of the target are deposited on a substrate to be

processed, and a film of the target is formed on the substrate. In a sputter apparatus, the pressure inside the chamber is controlled to be constant so as to form a stable plasma to achieve stable generation of Ar ions. Thereby, a number of atoms of the target released from the target can be constant, which achieves a constant deposition rate and permits a thickness control of the deposition film according to a deposition time.

That is one of ordinary skill in the art, when considering the Wong et al reference as a whole, would recognize that the pressure control means of Wong et al reference maintains a constant pressure in the sputter apparatus to maintain a constant deposition rate.

On the other hand, the purpose of maintaining the pressure in a chamber of the ALD apparatus relating to the Chiang et al reference is to maintain a temperature of the substrate constant. See numbered paragraph [0019] of the Chiang et al reference.

> [0019] The ALD process temperature must be selected carefully so that the first reactant is sufficiently adsorbed (e.g., chemisorbed) on the substrate surface, and the deposition reaction occurs with adequate growth rate and film purity. A temperature that is too high can result in desorption or decomposition (causing impurity incorporation) of the first reactant. A temperature that is too low may result in incomplete chemisorption of the first precursor, a slow or incomplete deposition reaction, no deposition reaction, or poor film quality (e.g., high resistivity, low density, poor adhesion, and/or high impurity content).

Accordingly, in an ALD process, the pressure in the chamber hardly gives influences to a deposition rate. Rather, in an ALD process, changes in the pressure in the chamber due to switching the supply of the source gases gives influences to the temperature of the substrate to be processed. As such, one purpose for maintaining a constant pressure in the claimed processing apparatus where there is ***an alternate supply of the process gases*** into the process chamber is to maintain a constant temperature of the substrate. Meanwhile, the purpose of maintaining a constant pressure in the sputter apparatus of the Wong et al reference is to maintain a constant deposition rate. Accordingly, the examiner will appreciate that the teaching of the Wong et al reference, which relates to a constant pressure in the

sputter apparatus, is not applicable to the ALD apparatus of the Chiang et al reference. Thus, there is no motivation to combine the Wong et al reference with the Chiang et al reference.

In other words, the sputtering teachings of the Wong et al reference would not logically commend itself to the problem of ALD described by the Chiang et al reference and relevant to the claimed processing apparatus.

In re GPAC Inc., 57 F.3d 1573, 35 USPQ2d 1116 (Fed. Cir. 1995), notes that:

> To support a finding that these twelve references are within the scope of the relevant prior art, we must therefore determine that they are analogous art that is "reasonably pertinent to the particular problem with which the inventor was involved." A reference is reasonably pertinent if, even though it may be in a different field of endeavor, it is one which, because of the matter with which it deals, ***logically would have commended*** itself to an inventor's attention in considering his problem. If a reference disclosure relates to the same problem as that addressed by the claimed invention, "that fact supports use of that reference in an obviousness rejection. An inventor may well have been motivated to consider the reference when making his invention.

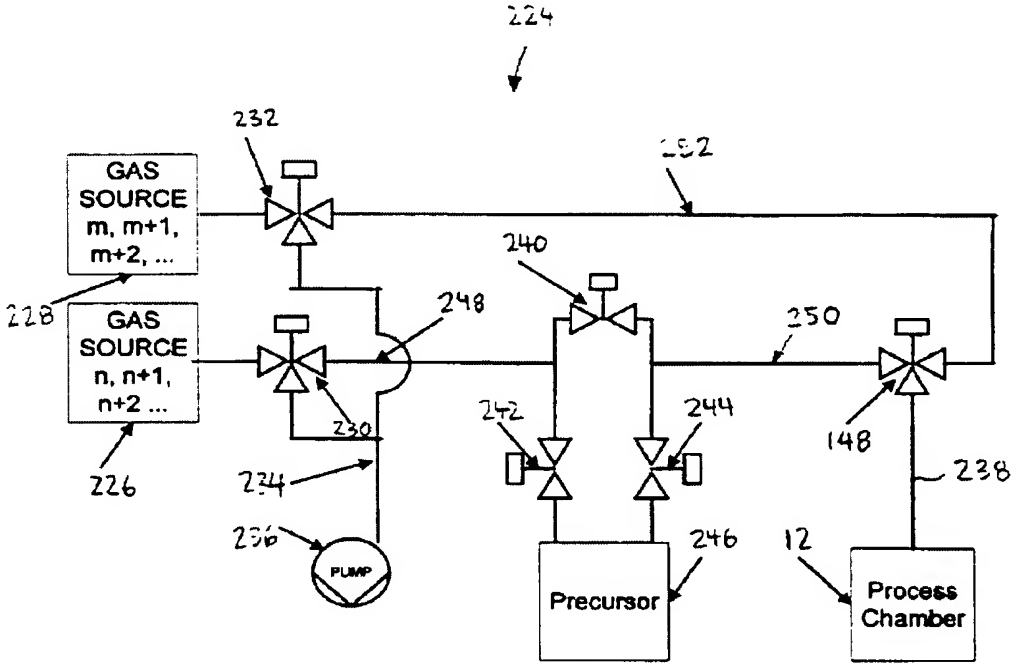
For this reason alone, the obviousness rejection should be withdrawn.

Moreover, In re Ratti, 270 F.2d 810, 813, 123 USPQ 349, 352 (CCPA 1959) reversed an obviousness rejection where the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate."

Here, the examiner suggested (as noted above) that the pressure control means of the Chiang et al reference could be replaced with one of the pressure control means of the Wong et al reference to provide an alternate control means to maintain a constant pressure in the process chamber. Yet, the gas delivery system in the Chiang et al reference (as shown in Figure 18 of the Chiang et al reference reproduced below) involves the delivery of a precursor material 246 (i.e., a liquid) by the flow of a carrier gas through the liquid. The Office takes a position that the speed of the exhaust pump and the position of the throttle

valve and shield controls the pressure in the Chiang et al reference. Meanwhile, the pressure control in the Wong et al reference acts to control pressure in the sputtering chamber by flow rate control of gas into the sputtering chamber.

Hence, to replace the pressure control system in the Chiang et al reference with a flow rate based control as in the Wong et al reference would change in the basic principle under which the Chiang et al construction was designed to operate, as the Chiang et al construction designed as a pumping speed control would now have to operate as a flow rate control under the examiner's proposed substitution.



For this additional reason, the obviousness rejection should be withdrawn.

For all these reasons, Claim 1 and dependent Claims 2-5 patentably define over the applied art and should be allowed.

Conclusion: In view of the present amendment and in light of the above discussions, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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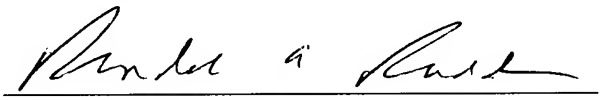

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